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| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.         | CONFIRMATION NO. |
|---|-------------|----------------------|-----------------------------|------------------|
| 10/718,426  | 11/20/2003  | Karim S. Boutros     | PD-200300A (BOE 0463<br>PA) | 9643             |
| 7590  | 08/15/2005  |                      | EXAMINER<br>KANG, DONGHEE   |                  |
| Steven W. Hays<br>Suite 250<br>28333 Telegraph Road<br>Southfield, MI 48034 |             |                      | ART UNIT<br>2811            | PAPER NUMBER     |

DATE MAILED: 08/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/718,426

Applicant(s)

BOUTROS ET AL

Examiner

Donghee Kang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10 June 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) 9-22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-8 and 23-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)     | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date. _____  | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Drawings*

1. The drawings were received on 06-10-05. These drawings are acceptable.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims **23-28** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Re claim **23**: the limitation "a device formed on one of said at least one layer of said group III-V semiconductor material" is not clear as where the device is positioned in the device. The group III-V semiconductor materials 18 are deposited successively to form the desired device structure. There is no device formed on the group III-V semiconductor materials.

Claims **24-28** are rejected because each includes the limitations of independent claim 23.

The examiner interprets a device formed on one of said at least one layer of group III-V material as a device formed from one of said at least one layer of group III-V material for further prosecution.

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

5. Claims **1-4, 6-8 & 23-28** are rejected under 35 U.S.C. 102(a) as being anticipated by Ermer et al. (US 6,380,601).

Re claims **1-2 & 23-24**, Ermer et al. teach a semiconductor device comprising (Fig.2):

a germanium substrate (22) having a p-type of doping (28); a nucleating layer (34) of group III-V materials (GaInP) disposed upon said germanium substrate, wherein the deposition of said nucleation layer also forms a germanium junction forming layer (30) on a portion of said germanium substrate (Col.5, lines 8-13) said germanium junction forming layer being actively doped with a constituent element (phosphorus) of said nucleation layer, said actively doped germanium junction forming layer having an opposite doping (n-type) to said first type of doping; at least one layer of a group III-V semiconductor material (36, 42a, 42b.....50) adjacent to and disposed upon said nucleation layer; a first electrical contact (38a) formed on said germanium substrate; a second electrical contact (38b) formed on one of said at least one layer of a group III-V semiconductor material (36); and a third electrical contact (38b') formed on said one of said at least one layer, said third electrical contact electrically coupled to said second electrical contact to form a device, said device selected from the group consisting of transistors, resistors and diodes. See also Col.2, line 53-Col.5, line 17.

Re claims **3-4 & 25-26**, Ermer et al. do not explicitly teach said germanium junction forming layer also being actively doped with a second constituent element from

said at least one layer of said group III-V semiconductor material. However, this feature is inherent in Ermer's device because Ermer's device is identical to the claimed structure and both structures are containing same materials (GaAs).

Re claim 6, Ermer et al. teach the level of said first dopant is a function of a desired frequency operating range and photo-response characteristics of the semiconductor device.

Re claims 7-8, Ermer et al. teach said nucleation layer (InGaP) is lattice-matched to said germanium substrate.

Re claims 27-28, Ermer et al. teach the device further comprising coupling said first electrical contact with said second electrical contact to form an optoelectronic integrated circuit.

#### ***Allowable Subject Matter***

6. Claim 5 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: Prior art of record fails to teach or suggest that the device further comprising a fourth electrical contact formed on said one or another of said at least one layer of said group III-V semiconductor material to form a second device.

#### ***Response to Arguments***

7. Applicant's arguments filed 6-10-05 have been fully considered but they are not persuasive. Applicant argues that Ermer et al. do not teach every features claimed in

independent claims 1 & 23. This is not convincing. Ermer et al. clearly teach substantially the claimed structure. See a statement of rejection for claims 1 & 23.

***Conclusion***

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Donghee Kang whose telephone number is 571-272-1656. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steve Loke can be reached on 571-272-1657. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Donghee Kang  
Primary Examiner  
Art Unit 2811

dhk